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Diagnostic imaging: from art to science?

THIS issue of the *Journal of Small Animal Practice* is dedicated to diagnostic imaging and related subjects, something most of us deal with on a daily basis in small animal practice. We have come a long way in a relatively short time period in this discipline and the articles in this issue give an excellent opportunity to review the current status as well as the past and future challenges.

Legacies from the past

When radiography was more or less the only diagnostic imaging modality available to clinicians, there was an artistic value attributed to the production and interpretation of those precious images that is lost in today's world. There were good and bad sides to it. Hand-developing a film, a fast dying art, requires skill and attention to detail to produce a high quality image, and a few of us still do this.

Radiographs have an intuitive quality that renders them at risk of being taken at face value. When we readily recognise many imaging features as anatomic structures further questioning often seems unnecessary (at least that's my theory). This attitude is reflected in many older scientific papers, where the statistical basis of the results was often rather meagre. Unfortunately, some repercussions of those pioneering studies are still felt today: bronchial mineralisation in dogs, sternal contact for assessment of heart size, osteopenia in hyperadrenocorticism, Codman's triangle in bone tumours, rounded hepatic margins, reverse pleural fissure lines, and the list goes on. . . Despite the fact that earlier assumptions about these radiographic signs and methods have never been proven, or in some cases even disproved, they are still frequently reiterated in daily practice.

Like a piece of abstract art, a radiograph shows very little of a complex object (in our case the patient) and leaves a lot of room for overreading. In the absence of rigid statistical criteria some of those subtle, poorly reproducible radiographic features have slipped into articles and textbooks. They often remain in our current day terminology despite the fact that few of us can recognise or correctly interpret them. Don't you wish the term *interstitial lung pattern* with further classification into *reticular*, *reticulonodular* and *striated patterns* had never been invented? How wide is a *widened gastroduodenal angle* (a sign of pancreatitis)? Do *punctate lucencies* really exist in canine nasal aspergillosis?

It is time to put those often astute observations to the test. Are they reproducible, specific and sensitive signs of disease? Several articles in this issue of *JSAP* do just this.

Current trends and challenges for the future

Today we have numerous diagnostic imaging modalities at our disposal either in our practices or via referral centres. We have to make choices, on what method to use for which diagnostic problem, based on solid scientific evidence. In this issue Penning and others (2006) investigate the correlation of spinal cord compression seen on MRI with the neurological status of the patient. Common assumptions are refuted or proven based on good science.

It is impressive to see the number of animals enrolled in many of the studies presented in this issue. Gibbons and others (2006) investigated 196 canine myelograms for the value of oblique views, Leppänen and others (2006) performed

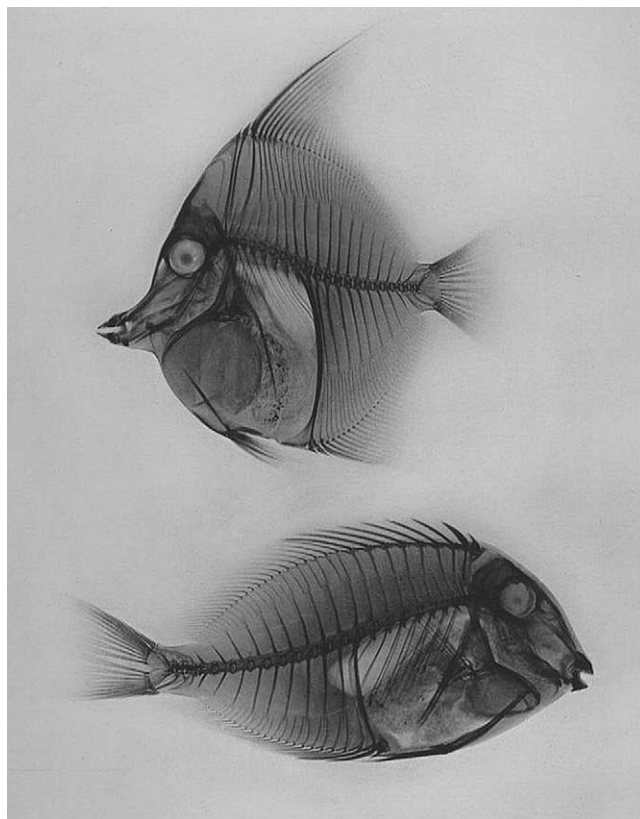


FIG 1. Radiograph of two dead fish (described as *Zanclus cornutus* and *Acanthurus nigros*) from the radiographic atlas of Eder and Valenta, published in 1896. Flat fish were preferred objects in the early days of radiography because of the limited output of the first X-ray tubes. What saturated contemporary viewers' curiosity for previously unseen internal detail of animals amazes us today as an aesthetic composition. Image courtesy of Prof. Mayrhofer and Dr. Hittmair, University of Vienna

a trial for a sedation protocol for radiographic procedures with 127 dogs and Beccaglia and Luvoni (2006) examined 315 ultrasonographic examinations. With those numbers, it is not surprising that meaningful conclusions can be drawn from the results of those studies.

People with an interest in imaging often make good anatomists. We have to, since they don't often make the real ones anymore! Macroscopic anatomy, once a mainstay of veterinary education has become sidelined by the multitude of other subjects to be covered in the curriculum, and subsequently the anatomic skill level in our profession has, in my opinion, declined. It does matter, because we risk losing ground in descriptive accuracy against what we have just gained by raising the bar for statistical evidence. A head is not the same as a skull. In the head, *rostral* is used as a directional term, *cranial* to describe the braincase. . . It is up to us to keep up those standards! The article by Watine and others (2006) who examine the optimal location for implantation corridors in canine vertebrae for fracture management exemplifies how relevant exact anatomical information is for clinical case management in today's world.

Future challenges are many. Previous, current and future imaging modalities should be compared and assessed critically for

their intended purposes. Having said this, we ought to leave some room for the artistic component of imaging. It's a major motivational factor for our job. Compare the volume rendered 3D computed tomography image of a canine skull on the cover of this issue (De Lorenzi and others 2006) with the radiograph of two fish (Fig 1) obtained in 1896 by Eder and Valenta (Mayrhofer and Bohrs 1995). We can still have fun making pretty images!

Tobias Schwarz
University of Wisconsin-Madison

References

- BECCAGLIA, M. & LUVONI, G. C. (2006) Comparison of the accuracy of two ultrasonographic measurements in predicting the parturition date in the bitch. *Journal of Small Animal Practice* **47**, 670-673
- DE LORENZI, D., BONFANTI, U., MASSERDOTTI, C., CALDIN, M., FURLANELLO, T. & BERTOLINI, G. (2006) Nasal melanosis in three dogs. *Journal of Small Animal Practice* **47**, 682-685
- EDER, J. M., VALENTA, E. (1896) Versuche über die Photographie mittelst der Röntgen'schen Strahlen. R. Lechner (W. Müller) K. u. K. Hof- und Universitätsbuchhandlung, Vienna; Wilhelm Knapp Verlagsbuchhandlung, Halle
- GIBBONS, S., MACIAS, C., DE STEFANI, A., PINCHBECK, G. L. & MCKEE, W. M. (2006) The value of oblique versus ventrodorsal myelographic views for lesion lateralisation in canine thoracolumbar disc disease. *Journal of Small Animal Practice* **47**, 658-662
- LEPPÄNEN, M. K., MCKUSICK, B. C., GRANHOLM, M. M., WESTERHOLM, F. C., TULAMO, R. & SHORT, C. E. (2006) Clinical efficacy and safety of dexmedetomidine and buprenorphine, butorphanol or diazepam for canine hip radiography. *Journal of Small Animal Practice* **47**, 663-669
- MAYRHOFFER, E., BORS, H. G. (1995) The world's first radiographs of animals – the atlas of Eder and Valenta (Vienna February 1896). *Wiener Tierärztliche Monatsschrift* **82**, 377-382
- PENNING, V., PLATT, S. R., DENNIS, R. CAPPELLO, R. & ADAMS, V. (2006) Association of spinal cord compression seen on MRI with clinical outcome in 67 dogs with thoracolumbar intervertebral disc extrusion. *Journal of Small Animal Practice* **47**, 644-650
- WATINE, S., CABASSU, J. P., CATHELAND, S., BROCHIER, L. & IVANOFF, S. (2006) Computed tomography study of implantation corridors in canine vertebrae. *Journal of Small Animal Practice* **47**, 651-657

Tobias Schwarz graduated from Berlin in 1995. From 1997 to 2000 he was the Petsavers' resident in small animal diagnostic imaging at the University of Glasgow Veterinary School, during which time he obtained the CertVR, DVR and DipECVDI qualifications in imaging. He served as a lecturer and assistant professor of radiology at the University of Pennsylvania in Philadelphia, USA, where he also obtained his American board certification in radiology (DACVR) and met his future wife Debbie. Since 2005, his new home is Madison, Wisconsin, where he practises and teaches radiology at the University of Wisconsin-Madison. He has a wide range of interests in diagnostic imaging but no intentions to study for further professional degrees.

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